

Remarks

Reconsideration of the above-identified application in view of the present amendment is respectfully requested. By the present amendment, claims 1, 17, 32, and 42 have been amended to delete the term biodegradable material and recite that the at least one of a fiber, a continuous matrix, a filler, or a cellular material, consists essentially of a polyhydroxyalkanoate resin. Support for this limitation can be found in claims 3, 10, and 13.

Claims 1, 17, 32, and 42 have also been amended to recite that the continuous matrix is the continuous matrix of a composite. Support for this limitation can be found in claim 3. The phrase "continuous matrix of a composite" as recited in the claims refers to the matrix material that surrounds and supports reinforcement materials of a composite and not to the more general definition of "formed entity" referred to in the Office Action.

Claims 1, 17, 32, and 42 have further been amended to change the term "cell" to "cellular" in order to correct a typographical error. Claims 13, 14, 15, and 43 have been amended to better define the claims and correct antecedent problems caused by amendment to the independent claims. Claim 16 has been cancelled.

Below is a discussion of the 35 U.S.C. §103 rejection of claims 1, 10-13 and 32, the 35 U.S.C. §103 rejection of claims 3, 7, 8, 34, 35, 39, and 40, the 35 U.S.C. §103 rejection of claims 9 and 14-16, the 35 U.S.C. §103 rejection of claims 4-6, 36-38, 39 and 41, the 35 U.S.C. §103 rejection of claims 17, 27-31, and 42-46, the 35 U.S.C. §103 rejection of claim 19, the 35 U.S.C. §103 rejection of claims 20, 24, and 25, and the 35 U.S.C. §103 rejection of claims 21-23 and 26.

1. 35 U.S.C. §103 rejection of claims 1, 10-13 and 32.

Claims 1, 10-13, and 32 were rejected under 35 U.S.C. §103 as being anticipated by U.S. Patent No. 5,939,467 to Wnuk et al. in view of U.S. Patent No. 6,342,402 to Buchanan et al. The Office Action states that Wnuk et al. discloses a biodegradable material consisting essentially of a PHA resin and that Buchanan shows this product being used as a vehicle component.

Claim 1 is patentable over Wnuk et al. and Buchanan et al. because Wnuk et al. in view of Buchanan et al. do not teach or suggest at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material consisting essentially of a polyhydroxyalkanoate resin.

As noted in the applicants' previous response, Wnuk et al. do not teach or suggest at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material "consisting essentially of a polyhydroxyalkanoate resin". Wnuk et al. teach polymer compositions that are derived from blends of various biodegradable polymers that can be formed into various materials, such as fibers. (Column 20, lines 21-22; Abstract). The polymer compositions include a polyhydroxyalkanoate (PHA) polymer that is blended with another polymer, such as a polyurethane, PVA, and polylactide. Column 24, lines 3-5 and column 26, third complete paragraph, both noted in the Office Action, describe formulations of various blends of PHAs and other polymers.

For example, column 23, lines 49+ and column 24 lines 1-5, recite:

"Polyhydroxyalkanoates are generally employed in an amount of at least about 10% by weight, based on the total weight of the biodegradable polymers in the blend. The thermomechanical integrity of the compositions herein tend to increase with increasing PHA content, with a maximum thermomechanical integrity benefit typically occurring in the range of from about 20 to about 25 weight % PHA. Polymer compositions having PHA levels greater than about 25 weight % are not economically preferred. In addition, polymer compositions having PHA at these higher levels tend to exhibit processing difficulties (increased set time and decreased melt strength). Moreover, the higher levels of PHA can degrade the mechanical properties of end products of the composition, especially where the PHA is PHB or PHBV. For all of these reasons, compositions containing more than about 20 to about 25 weight % PHA may not be preferred. For film applications, a practical upper limit of PHA is about 40 to about 45 weight %. This ensures that the PHA is the dispersed phase and thereby minimizes the negatives associated with the PHA in film applications. For fiber applications a practical upper limit is about 70 to about 80 weight % PHA. For fibers, the remainder is typically of a material that imparts sufficient melt strength, e.g., a mechanically limited polymer."

Moreover, column 26, third complete paragraph, recites:

"According to this embodiment of the invention, the composition may contain from about 10% to about 80% polyhydroxyalkanoate and, respectively, from about 90% to about 20% polylactide, based on the total weight of these polymers. These levels of PHA and PLA tend to provide a compatible blend having a desirable combination of thermomechanical integrity and melt processability. Preferably, the composition contains from about 20% to about 60% polyhydroxyalkanoate and, respectively, from about 80% to about 40% polylactide, based on the total weight of these polymers. This composition unexpectedly exhibits synergistic mechanical properties (e.g., the ultimate elongation and tear strength of a blend of these polymers exceeds that of the individual polymers)."

The applicants' fail to see where in these paragraphs or anywhere else in Wnuk et al. it is taught or suggested to form a fiber, a continuous matrix of a composite, a filler, or a cellular material from anything other than a blend of

polymers. A fiber, a continuous matrix of a composite, a filler, or a cellular material formed from a blend of polyhydroxyalkanoate resin and another polymer, such as a polyurethane or PVA, does not consist essentially of a polyhydroxyalkanoate resin.

The transition phrase "consists essentially of" as discussed in the MPEP at section 2111.03 limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristics of the claimed invention. (emphasis added in the MPEP). The polymers blended with the PHAs taught in Wnuk et al., however, affect the basic and novel characteristics of the PHAs. Particularly, column 24, lines 3-5, which are noted in the Office Action, suggest the additional polymer imparts melt strength to the PHA it is blended with. Thus, films, fibers, and non-wovens taught in Wnuk et al. are formed from a blend of polymers a portion of which is not a polyhydroxyalkanoate; and, therefore, such films, fibers, and non-wovens taught in Wnuk et al. do not consist essentially of a polyhydroxyalkanoate.

Buchanan et al. also do not teach or suggest at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material "consisting essentially of a polyhydroxyalkanoate resin". Buchanan et al. teach cellulose esters can form binary or ternary blends with aliphatic polyesters and aliphatic-aromatic copolymers. (Column 7, lines 25-40). One type of aliphatic polyester listed is a polyhydroxyalkanoate. (Column 10, lines 15-31). A fiber, a continuous matrix of a composite, a filler, or a cellular material formed from a blends of cellulose esters and aliphatic polyesters taught in Buchanan et al. would not consist essentially of a polyhydroxyalkanoate resin.

Thus, Wnuk et al. in view of Buchanan et al. do not teach or suggest at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material consisting essentially of a polyhydroxyalkanoate resin. Therefore, withdrawal of the rejection of claim 1 is respectfully requested.

Claims 10-12 depend either directly or indirectly from claim 1 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 1 and the and because of the specific limitations recited in claims 10-12.

Claim 32 recites limitations similar to the limitations of claim 1 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 1 and because of the specific limitations recited in claim 32.

**2. 35 U.S.C. §103 rejection of claims 3, 7, 8, 34, 35, 39, and 40.**

Claims 3, 7, 8, 34, 35, 39, and 40 were rejected under 35 U.S.C. §103 as being unpatentable over Wnuk et al. in view of Buchanan et al. and Noda et al.

Claims 3 and 34 depend respectfully from claims 1 and 32 and recite the limitation that the vehicle component is made from a composite, the composite comprising a continuous matrix of the polyhydroxyalkanoate resin reinforced with a biodegradable fiber.

The Office Action suggests that Wnuk et al. in view of Buchanan et al. do not disclose a PHA resin and a biodegradable fiber, while Noda shows this fiber. The motivation to combine the teachings of Noda with Wnuk et al. and Buchanan et al. provided in the Office Action is that it would have been obvious to one with ordinary skill in the art at the time the invention was made to include these arrangements to

provide increased biodegradability, thus aiding the environment when it is finally discarded.

Claims 3 and 34 are patentable over Wnuk et al. in view of Buchanan et al. and Noda et al. because of the aforementioned deficiencies in the rejection with respect to claims 1 and 32. Additionally, claims 3 and 34 are allowable over Wnuk et al. in view of Buchanan et al. and Noda et al. because the motivation provided by the Office Action to combine the teachings of Noda et al. with Wnuk et al. and Buchanan et al. is mere speculation at best and is not supported by Wnuk et al., Buchanan et al. and Noda et al.

Wnuk et al. Buchanan et al., and Noda do not teach or suggest that the addition of "wood pulp" increases the biodegradability of the material as suggested by the Office Action or that it is desirable to increase the biodegradability of the biodegradable material. Thus, Wnuk et al. in view of Buchanan et al. and Noda et al. do not teach all the limitations of claims 3 and 34 and withdrawal of the rejections of claims 3 and 34 are respectfully requested.

Claims 7, 8, 35, 39, and 40 depend either directly or indirectly from claims 3 and 34 and therefore would be allowable for the aforementioned deficiencies in the rejection with respect to claims 3 and 14 and for the specific limitations recited in claims 7, 8, 35, 39, and 40.

3. **35 U.S.C. §103 rejection of claims 9 and 14-15.**

Claims 9 and 14-15 were rejected under 35 U.S.C. §103 as being obvious over Wnuk et al. in view of Buchanan et al. and Noda et al. and further in view of U.S. Patent No. 6,607,994 to Soane et al.

Claim 9 depends directly from claim 3 and recites that the biodegradable fiber is cotton. Claim 9 is allowable over Wnuk et al. in view of Buchanan et al., Noda et al., and Soane because of the aforementioned deficiencies with in the rejection with respect to claim 3 and because of the specific limitations recited in claim 9.

Claim 14 depends directly from claim 1. Claim 14 recites the vehicle component comprises a filler material. Claim 14 is patentable over Wnuk et al. in view of Buchanan et al., Noda et al., and Soane et al. because of the aforementioned deficiencies in the rejection with respect to claims 1. Additionally, claim 14 is patentable over Wnuk et al. in view of Buchanan et al., Noda et al., and Soane et al. because Soane et al. neither teach nor suggest that the addition of a filler increases the biodegradability of the material as suggested by the Office Action or that it is desirable to increase the biodegradability of the material. Absent some support for the Office Action's motivation to combine the references, such as some teaching in the references themselves, the Office Actions' motivations for combining the references are, at best, mere speculation, which cannot be used as a basis for the rejection.

Thus, Wnuk et al. in view of Buchanan et al., Noda et al., and Soane do not teach all the limitations of claim 14 and withdrawal of the rejections of claim 14 is respectfully requested.

Claims 15 depends directly from claim 14 and therefore would be allowable for the aforementioned deficiencies in the rejection with respect to claim 14 and for the specific limitations recited in claim 15.

**4. 35 U.S.C. §103 rejection of claims 4-6, 36-38, 39 and 41.**

Claims 4-6, 36-38, 39 and 41 were rejected under 35 U.S.C. §103 as being obvious over Wnuk et al. in view of Buchanan et al. and Noda et al. and further in view of Soane et al.

Claim 4 depends directly from claim 3 and recites that the biodegradable fiber comprises a continuous or discontinuous fiber. Claim 4 is allowable over Wnuk et al. in view of Buchanan et al., Noda et al., and Soane because of the aforementioned deficiencies with in the rejection with respect to claim 3 and because of the specific limitations recited in claim 4.

Claims 5 and 6 also depend directly from claim 3 and contain similar limitations as claim 3 and therefore should be allowable for the aforementioned deficiencies of the rejection with respect to claim 3 and for the specific limitations recited in claims 5 and 6.

Claims 36-38 contain limitations similar to claims 4, 5, and 6 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claims 4, 5 and 6 and because of the specific limitations recited in claims 36-38.

Claims 39 and 41 depend either directly or indirectly from claim 34 and therefore would be allowable for the aforementioned deficiencies in the rejection with respect to claim 34 and for the specific limitations recited in claims 39 and 41.

**5. 35 U.S.C. §103 rejection of claims 17, 27-31, and 42-46.**

Claims 17, 27-31, and 42-46 were rejected under 35 U.S.C. §103 as being unpatentable over Wnuk in view of U.S. Patent No. 6,455,449 to Veiga et al.

Claim 17 recites a vehicle occupant protection apparatus that comprises a reaction canister and an inflatable vehicle occupant protection device contained in the reaction canister. At least one of the reaction canister and the inflatable vehicle occupant protection device is biodegradable and comprises at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material. The fiber, the continuous matrix, the filler, or the cell material consists essentially of a polyhydroxyalkanoate resin, the polyhydroxyalkanoate resin being a homo-polymer or copolymer of hydroxyalkanoate monomer units selected from the group consisting of 3-hydroxybutyrate, 3-hydroxyvalerate, 3-hydroxyoctanoate, 4-hydroxybutyrate, 5-hydroxyvalerate, 5-hydroxycaproate, 6-hydroxycaproate, 6-hydroxycaprylate, and 6-hydroxypropionate.

Claim 17 is patentable over Wnuk et al. and Veiga et al. because Wnuk et al. and Veiga et al. do not teach or suggest at least one of a fiber, a continuous matrix, a filler, or a cellular material consisting essentially of a polyhydroxyalkanoate resin.

As noted with respect to claim 1, Wnuk et al. do not teach or suggest at least one of a fiber, a continuous matrix of a composite, a filler, or a cellular material "consisting essentially of a polyhydroxyalkanoate resin".

Veiga et al. teach nothing about PHAs or suggest PHAs can be used in the fabrication of a reaction canister or an inflatable vehicle occupant protection device.

Thus, Wnuk et al. in view of Veiga et al. fail to teach or suggest all of the limitations of claim 17 therefore withdrawal of the rejection of claim 17 is respectfully requested.

Claims 27-31 depend either directly or indirectly from claim 17 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 17 and for the specific limitations recited in claims 27-31.

Claims 42-46 contain similar limitations as claims 27-31 and therefore should be allowable because of the aforementioned deficiencies of the rejection with respect to claim 2-31 and for the specific limitations recited in claims 42-46.

**6. 35 U.S.C. §103 rejection of claim 19.**

Claim 19 was rejected under 35 U.S.C. §103 as being obvious over Wnuk et al. in view of Veiga et al., and further in view of Buchanan et al.

Claim 19 depends from claim 17 and further recites that the reaction canister is biodegradable and comprises a polyhydroxyalkanoate resin.

Claim 19 is patentable over Wnuk et al. in view of Veiga et al., and further in view of Buchanan et al. because Wnuk et al. in view of Veiga et al. and Buchanan et al. do not teach or suggest at least one of a fiber, a continuous matrix, a filler, or a cellular material consisting essentially of a polyhydroxyalkanoate resin..

As noted above with respect to claim 1, Wnuk et al. and Buchanan et al. teach PHA blended with other polymers can be used to form fibers, films, and non-wovens and do not teach or suggest fibers, continuous matrix, fillers, or cellular material

consisting essentially of a polyhydroxyalkanoate resin. Moreover, as noted above with claim 17, Veiga et al. do not teach PHAs. Therefore, Wnuk et al. in view of Buchanan et. al. and Veiga et al. do not teach all of the limitations Claim 19. Therefore, withdrawal of the rejection of claim 19 is respectfully requested.

**7. 35 U.S.C. §103 rejection of claims 20, 24, and 25.**

Claims 20, 24, and 25 were rejected under 35 U.S.C. §103 as being obvious over Wnuk in view of Veiga, Buchanan, and further in view of Noda.

Claim 20 depends from claim 19 and further recites that the reaction canister is made from a composite. The composite comprises a continuous matrix of the polyhydroxyalkanoate resin reinforced with a biodegradable fiber.

Claim 20 is allowable over Wnuk in view of Veiga, Buchanan, and further in view of Noda because of the aforementioned deficiencies in the rejection with respect to claim 19. Additionally, claims 20 is allowable over Wnuk et al. in view of Veiga, Buchanan, and further in view of Noda because Noda et al. neither teach nor suggest that the addition of a biodegradable fiber increases the biodegradability of the material as suggested by the Office Action or that it is desirable to increase the biodegradability of the material.

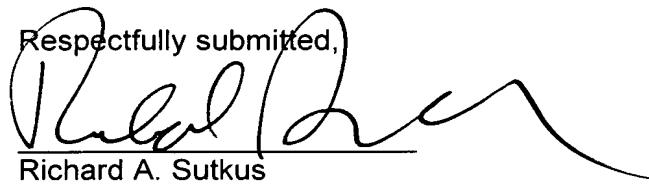
Claims 24 and 25 depend respectfully from claim 20 and therefore are allowable because of the aforementioned deficiencies in the rejection with respect to claim 20 and for the specific limitations recited in claims 24 and 25.

**8. 35 U.S.C. §103 rejection of claims 21-23 and 26.**

Claims 21-23 and 26 were rejected under 35 U.S.C. §103 as being obvious over Wnuk in view of Veiga, Buchanan, and Noda, and further in view of Soane.

Claims 21-23 and 26 depend either directly or directly from claim 20 and therefore should be allowable because of the aforementioned deficiencies in the rejection with respect to claim 20 and the specific limitations recited in claims 21-23 and 26.

In view of the foregoing, it is respectfully submitted that the above-identified application is in condition for allowance, and allowance of the above-identified application is respectfully requested.

Respectfully submitted,  
  
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